

Claims

What is claimed is:

5 1. A method in a first vending machine of a plurality of vending machines for locating a nearby alternate vending machine having a desired product, the method comprising the steps of:

making available to the first vending machine information from nearby ones of the plurality of vending machines for coordinating product availability and vending machine location;

10 determining, by the first vending machine, that the desired product is no longer available at the first vending machine;

obtaining thereafter, by the first vending machine, the information comprising a location of the nearby alternate vending machine for the desired product; and

conveying by the first vending machine said location to a customer.

15 2. The method of claim 1, wherein the conveying step comprises the step of conveying said location to the customer in response to a selection of the desired product by the customer.

20 3. The method of claim 1, wherein the obtaining step comprises the steps of:

maintaining in the first vending machine a list of candidate alternate vending machines located near the first vending machine; and

communicating with at least one of the candidate alternate vending machines to locate the desired product, when the first vending machine has no availability of the desired product.

25 4. The method of claim 1, wherein the obtaining step comprises the steps of:

communicating, by a transceiver having a limited range, with at least one candidate alternate vending machine within range of the transceiver, when the first vending machine has no availability of the desired product.

5. The method of claim 4, wherein the obtaining step further comprises the steps of:
querying the at least one candidate alternate vending machine for its
location;
calculating a distance from the first vending machine to the at least one
candidate alternate vending machine; and
5 defining the at least one candidate alternate vending machine to be the
nearby alternate vending machine for the desired product, only when the distance is less
than a predetermined distance.

10 6. The method of claim 1, wherein the plurality of vending machines also
communicate with a server, and wherein the obtaining step comprises the steps of:

sending by the first vending machine a first query to the server regarding
the desired product, in response to the first vending machine exhausting all stock of the
desired product;

15 determining by the server a candidate alternate vending machine near the
first vending machine;

transmitting by the server a second query regarding the desired product to
the candidate alternate vending machine;

20 receiving, by the server, a response from the candidate alternate vending
machine indicating that the desired product is available, thereby defining the candidate
alternate vending machine as the nearby alternate vending machine for the desired product;
and

returning by the server to the first vending machine said location of the
nearby alternate vending machine.

7. The method of claim 6, further comprising in the server the steps of:

recording, in a transactions list, an entry comprising identifiers of the first vending machine, the nearby alternate vending machine, and the desired product;

receiving a report from one of the plurality of vending machines indicating that a product is no longer available;

comparing an identifier of the one of the plurality of vending machines and the product with the transactions list to determine whether the one of the plurality of vending machines is serving as the nearby alternate vending machine for the product; and

finding for the first vending machine another alternate vending machine for the product, when the one of the plurality of vending machines is serving as the nearby alternate vending machine for the product.

8. The method of claim 6, further comprising in the server the steps of:

recording, in a transactions list, an entry comprising identifiers of the first vending machine and the nearby alternate vending machine, and the desired product;

receiving a report from one of the plurality of vending machines indicating that a product has become available;

comparing an identifier of the one of the plurality of vending machines and the product with the transactions list to determine whether the one of the plurality of vending machines is the first vending machine and the product is the desired product; and

clearing the entry in the transactions list, when the one of the plurality of vending machines is the first vending machine and the product is the desired product.

9. The method of claim 8, further comprising in the server the steps of:

determining whether the one of the plurality of vending machines is nearer than the nearby alternate vending machine is to the first vending machine, when the one of the plurality of vending machines is not the first vending machine and the product is the desired product; and

redefining, for the first vending machine, the one of the plurality of vending machines as the nearby alternate vending machine for the desired product, when the server has determined the one of the plurality of vending machines is nearer to the first vending machine.

10. The method of claim 1, wherein the plurality of vending machines also communicate with a server, and wherein the method further comprises the steps of:

communicating to the server by ones of the plurality of vending machines a product availability indicator whenever a product availability changes; and

maintaining in the server a database of current product availability indicators and corresponding vending machine locations, and

wherein the obtaining step comprises the steps of:

requesting from the server by the first vending machine said location of the nearby alternate vending machine for the desired product, when the customer selects the desired product at the first vending machine; and

sending, thereafter by the server, said location to the first vending machine.

11. An apparatus in a first vending machine having an inventory sensor and a customer interface, the apparatus for locating a nearby alternate vending machine having a desired product, the apparatus comprising:

a transceiver for providing communications; and

a processing system coupled to the transceiver for controlling the transceiver and processing the communications, the processing system further coupled to the inventory sensor and the customer interface,

wherein the processing system is programmed to:

cooperate with the inventory sensor to determine that the desired product is no longer available at the first vending machine;

cooperate with the transceiver to obtain information made available to the first vending machine from a plurality of vending machines for coordinating product availability and vending machine location, the information comprising a location of the nearby alternate vending machine for the desired product; and

cooperate with the customer interface to convey said location to a customer.

12. The apparatus of claim 11, wherein the processing system is further programmed to convey said location to the customer in response to a selection of the desired product by the customer through the customer interface.

13. The apparatus of claim 11, wherein the processing system is programmed to:
maintain a list of candidate alternate vending machines located near the first vending machine; and

control the transceiver to communicate with at least one of the candidate
alternate vending machines to locate the desired product, when the first vending machine
has no availability of the desired product.

14. The apparatus of claim 11,

wherein the transceiver has a limited range, and

wherein the processing system is programmed to communicate with at least
one candidate alternate vending machine within range of the transceiver, when the first
vending machine has no availability of the desired product.

15. The apparatus of claim 14, wherein the processing system is programmed to:

query the at least one candidate alternate vending machine for its location;

calculate a distance from the first vending machine to the at least one
candidate alternate vending machine; and

define the at least one candidate alternate vending machine to be the nearby
alternate vending machine for the desired product, only when the distance is less than a
predetermined distance.

16. The apparatus of claim 11, wherein the plurality of vending machines communicate
with a server, and wherein the processing system is further programmed to:

send a first query to the server regarding the desired product, in response to
the first vending machine exhausting all stock of the desired product; and

receive from the server said location of the nearby alternate vending
machine.

17. The apparatus of claim 16, wherein the processing system is further programmed
to:

send a report to the server indicating that a product has become available, in
response to the product being restocked after having been unavailable.

20. The server of claim 18, wherein the processing system is further programmed to:

record, in a transactions list, an entry comprising identifiers of the first vending machine, the alternate vending machine, and the desired product;

receive a report from one of the plurality of vending machines indicating
5 that a product has become available;

compare an identifier of the one of the plurality of vending machines and the product with the transactions list to determine whether the one of the plurality of vending machines is the first vending machine and the product is the desired product; and

clear the entry in the transactions list, when the one of the plurality of
10 vending machines is the first vending machine and the product is the desired product.

21. The server of claim 20, wherein the processing system is further programmed to:

determine whether the one of the plurality of vending machines is nearer
than the alternate vending machine is to the first vending machine, when the one of the
15 plurality of vending machines is not the first vending machine and the product is the
desired product; and

redefine, for the first vending machine, the one of the plurality of vending
machines as the alternate vending machine for the desired product, when the server has
determined the one of the plurality of vending machines is nearer to the first vending
20 machine.

22. A server for locating an alternate vending machine near a first vending machine, the alternate vending machine having a desired product that is unavailable at the first vending machine, the server comprising:

a processing system; and

5 a transceiver coupled to the processing system for communicating with a plurality of vending machines,

wherein the processing system is programmed to:

receive from ones of the plurality of vending machines a product availability indicator whenever a product availability changes;

10 maintain a database of current product availability indicators and corresponding vending machine locations;

receive a request from the first vending machine for a location of the alternate vending machine for the desired product, when a customer selects the desired product at the first vending machine; and

15 send said location to the first vending machine.